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U.S. Bureau of Industrial Alcohol

Facts concerning industrial alcohol

Washington, D.C.

1932

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FACTS

CONCERNING

INDUSTRIAL ALCOHOL

Information Relating to Alcohol for Lawful Use and Government Methods of Control and Supervision

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U. S. TREASURY DEPARTMENT
BUREAU OF INDUSTRIAL ALCOHOL
WASHINGTON, D. C.

U. S. TREASURY DEPARTMENT
ANDREW W. MELLON, Secretary
BUREAU OF INDUSTRIAL ALCOHOL
JAMES M. DORAN, Commissioner

FACTS

CONCERNING

INDUSTRIAL ALCOHOL

Information Relating to Alcohol for Lawful Use in Arts Sciences, and Industry, and Government Methods of Control and Supervision

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932

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PREFACE

The purpose of this publication is to supply a general need for facts relating to industrial alcohol and the vital part which it plays in American business life.

Few outside of chemical lines of activity realize how the use of alcohol, in both its pure and denatured form, has contributed to the upbuilding of American commerce and the comfort and welfare of mankind.

The facts narrated, in the form of questions and answers, are designed primarily to be of constructive value to the public at large. The questions covered include those about which the public has evidenced a desire to be informed.

Likewise, this publication fills a current need for authentic information which is the subject of numerous inquiries reaching the Bureau of Industrial Alcohol at Washington and the Supervisors of Permits in the 12 regional permit districts.

The reader should bear in mind that this publication is not a scientific treatise, nor should it be construed, in any sense, as a regulation. Official regulations take an entirely different form as to legal force and content.

The aim is merely to present important facts, as free as possible of technical phrasing, as a means of promoting better understanding by the public.

INDUSTRIAL ALCOHOL

Introduction

The chemical use of alcohol in the arts, sciences, and industry is naturally a subject so highly technical in its varied phases that outside of chemical lines of activity the average person is not readily capable of grasping its full meaning or importance in commercial affairs, or in everyday modern life.

Alcohol as a *chemical raw material* is the basic ingredient that enters into literally thousands of manufactured products, or commodities that contribute greatly to the health, comfort, and welfare of every American household.

The general public has manifested a desire to know more about the constructive and lawful uses of alcohol, not as that word is sometimes loosely interpreted in a popular sense, but in its practical application to the everyday necessities of mankind.

The aim of this presentation of varied facts, in the form of questions and answers, is designed to make plain to the average reader, in language free of technical phrasing as far as possible, essential facts relating to industrial alcohol and matters dealing with Government control and supervision over alcohol for lawful uses.

It should be borne in mind that the chemical industry in all of its ramifications ranks to-day as one of the Nation's principal industries and in point of capi-

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talization and wealth is surpassed by few in the entire realm of American commerce.

Thousands of manufactured products could not be made available to the public to-day unless alcohol as a chemical raw material were used in the process of manufacture. Lawful products made from alcohol have a market value of several billion dollars a year.

Hundreds of thousands of men and women gain their livelihood in these industries. American citizens buy alcoholic products at a relatively low price because manufacturers are able to use denatured alcohol, free of Federal tax, under the provisions of the tax free denatured alcohol act passed by Congress more than 25 years ago.

The magnitude of the Government's task in controlling *alcohol for lawful commercial purposes* may be easily realized by the fact that there are to-day in excess of 177,000 individuals, firms, and corporations, whose business operations are directly under Government control and supervision, by virtue of permits issued by the Bureau of Industrial Alcohol.

Clearer understanding of the duties and functions of the Bureau of Industrial Alcohol may be gained by recalling the provisions of the enabling act to enforce the provisions of the eighteenth amendment.

Congress specifically set forth the purpose "to *regulate* the manufacture, production, use, and sale of high-proof spirits *for other than beverage purposes*, to *insure an ample supply of alcohol and promote its use* in scientific research and the development of fuel, dye, and other lawful industries."

The law also imposed upon officials the duty to place industries using alcohol as a chemical raw material upon the highest possible plane of scientific and commercial efficiency.

TYPICAL INQUIRIES BY THE PUBLIC AND FACTUAL ANSWERS IN BRIEF OUTLINE

INDUSTRIAL ALCOHOL

What is industrial alcohol?

Industrial alcohol under Government control includes *ethyl alcohol* in its pure state as well as many formulas of *denatured alcohol* used in lawful manufacturing or for other legitimate uses in science, the arts and industries.

DENATURED ALCOHOL

What is denatured alcohol?

Denatured alcohol is pure alcohol to which are added certain substances which are called *denaturants*, to render the liquid *unfit for beverage purposes*. The denaturants, however, do not interfere with the special commercial uses for which the alcohol is intended.

ETHYL ALCOHOL

What is ethyl alcohol?

Ethyl alcohol is alcohol that is produced in its pure state. It is manufactured largely from the fermentation of molasses and grain. It is also now being manufactured synthetically from ethylene gas.

Ethyl alcohol made *synthetically* is produced by a combination of chemical elements, as *distinguished from fermentation processes.*

DENATURATION

Why is alcohol denatured?

To render it unfit for beverage purposes, but suitable for industrial uses. There is a Federal tax on ethyl (pure) alcohol for certain uses. The tax is several times the value of the alcohol.

If manufacturers used tax-paid ethyl alcohol, the finished product would have to be sold at a much higher price than at the present time.

There is *no tax on denatured alcohol.* Manufacturers use it in the production of thousands of lawful commodities of everyday use.

TAX-FREE ALCOHOL

Why is denatured alcohol not taxed?

Denatured alcohol is intended solely for use in arts, science, and industry. Congress made it free of Federal tax to *promote American industry.*

PURE ALCOHOL

What is alcohol?

Alcohol is that substance known as *ethyl (pure) alcohol,* hydrated oxide of ethyl, or spirit of wine, from whatever source or process produced, having a proof of 160° or more. It does not include the substances known as whisky, brandy, rum, or gin.

HIGHEST PROOF

What is meant by "absolute alcohol"?

Alcohol at the highest degree of proof is 200, which is absolute alcohol (ethyl), or 100 per cent alcohol, by volume.

ALCOHOL STRENGTH

What is meant by "alcohol proof"?

"Alcohol proof" is a term expressing the strength or quantity of alcohol, and is equivalent to the alcohol, by volume, multiplied by two. For example, 190-proof alcohol is 95% alcohol, by volume.

WITHDRAWN TAX-PAID

What is tax-paid alcohol?

Tax-paid alcohol is ethyl (pure) alcohol, released from bond and sold under Government permit, for certain medicinal, scientific, or other lawful use, with the full Government tax of $1.10 per proof gallon paid on all withdrawn.

TAX-FREE ACT

How long has the United States authorized tax-free denatured alcohol?

Since June 7, 1906. On that date the tax-free denatured alcohol act was enacted, lifting the Federal tax on all alcohol, properly denatured, for lawful industrial use.

TAX REMOVED

What was the purpose of removing the tax from denatured alcohol used in industry?

Thousands of products now made with alcohol are considered everyday necessities. The retail price is much less than if a tax were imposed on the alcohol used in their manufacture.

The tax-free denatured alcohol law promotes scientific research and development of American trade, by

increasing the number of industries and by providing employment for a larger number of its citizens.

FOREIGN PRACTICE

Do other countries use tax-free denatured alcohol in industry?

Yes. The principal countries had tax-free industrial alcohol laws before the United States passed the tax-free denatured alcohol act 25 years ago.

DIFFERENT ALCOHOLS

How many kinds of industrial alcohol are authorized by the Government?

There are three kinds of industrial alcohol: (1) Ethyl (pure) alcohol; (2) completely denatured alcohol; (3) specially denatured alcohol.

DIFFERENT FORMULAS

What is the difference between the completely denatured and specially denatured alcohol?

Completely denatured alcohol is mainly used for automobile antifreeze purposes and for fuel, light, and power. It is sufficiently denatured to preclude the possibility of its being used for beverage purposes. Hence it can be sold and used without obtaining a permit.

Specially denatured alcohol is denatured by the addition of various substances under 68 Government formulas. Special denaturants are authorized for alcohol used in a large number of specialized industries.

A safeguard against diversion of the specially denatured alcohol formulas is the requirement that every manufacturer using specially denatured alcohol must

furnish bond and obtain a permit from the Government.

There is an investigation of the company, plant, and business plans before a permit is granted. Systematic inspection of all transactions under the permit is made by Government officers to insure compliance with the law.

COMMERCIAL UTILITY

What are the uses of denatured alcohol?

Completely denatured alcohol is used for the following: Annealing jewelry, antifreeze for automobiles, cleaning brass and silver, cleaning fabrics, decarbonizing, dipping fluids, disinfectants, engine cleaning, etching, fumigating lamps, gas mantles, insect powders, scientific testing, shoe blacking, and soap dyes.

Specially denatured alcohol is used in the manufacture of many products including the following:

Antiseptic solutions.
Artificial leather.
Artificial silk.
Barber preparations.
Bathing alcohol.
Bay rum.
Candy glaze.
Cement.
Chemicals.
Cleaning fluids.
Dentifrices.
Deodorants.
Disinfectants.
Drugs.
Dye intermediates.
Dyes.
Electrical supplies.
Ether.
Ethyl acetate.
Ethylene.
Fungicides.
Hair tonics.
Hats.
Hydraulic-brake fluid.
Insecticides.
Lacquers.
Lacquer thinners.
Leather solutions.
Liniments.
Lotions.
Lubricating oils.
Medical supplies.
Nitrocellulose.
Paints.
Perfumes.
Petroleum oils.
Photographic supplies.
Polishes.

Pyroxylin.	Tincture of iodine.
Pyroxylin plastics.	Tobacco.
Resin.	Tobacco solutions.
Resin materials.	Toilet preparations.
Shellacs.	Toilet waters.
Soaps of all kinds.	Varnishes.
Solvents.	Vinegar.

PERMIT CONTROL

How does the Government control industrial alcohol for lawful uses?

Control is maintained by a *system of permits* and *inspection* of all business transactions authorized.

A permit can not be obtained until after thorough investigation. After a permit has been issued, all transactions involving industrial alcohol must be recorded and open to inspection by Government officers.

The Bureau of Industrial Alcohol maintains a standardized system of procedure relating both to permits and inspection.

OFFICE PROCEDURE

What volume of official business procedure is involved in the maintenance of proper control of industrial alcohol?

The Bureau of Industrial Alcohol has to maintain a permissive organization well equipped to meet the needs of public business.

The bureau's supervisory control over the chemical industries using alcohol is *primarily a business function.*

In the maintenance of adequate safeguards over alcohol and its lawful uses in manufacturing or for other

purposes a great deal of detailed office procedure is necessary.

This can be realized from the fact that each permit involves a certain routine of regular office procedure.

The volume of work thus entailed may be imagined from the fact that there are outstanding in excess of 177,000 permits of all classes.

ALCOHOL PRODUCTION

Who produces alcohol needed for industrial uses?

Industrial alcohol is produced at plants that are operated under permits issued by the Government. The plants are under the personal supervision of Government officers stationed at the plants.

PRODUCTION CONTROLLED

What is the Government's method of authorizing the manufacture of industrial alcohol?

Manufacture of alcohol is authorized only after permits have been obtained from the Government.

Permits are not issued until there has been full compliance with required specifications as to building and equipment. Satisfactory investigation also is necessary regarding the officers of the company and the source of their capital.

The alcohol-plant owners are heavily bonded to abide by Government regulations. The Government obtains a perpetual lien on the property, which is liable to forfeiture on proof of violation of the law and regulations governing the operation of the plant.

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DIVERSIONS REDUCED

What effect has Government chemical research had in reducing alcohol diversion to unlawful channels?

Alcohol diversion detected some time ago in some of the *specially denatured-alcohol* formulas has been practically stopped following extended chemical research.

For example, chemical research caused a modification to be made in specially denatured-alcohol formula No. 44–A which practically eliminated the diversion of lacquer thinners and solvents.

A petroleum distillate called calol ethatate was required as a denaturant for ethyl acetate. This effectively checked ethyl-acetate diversion.

The policy of withdrawing certain formulas and the substitution of others has benefited industry and protected the interests of the Government.

ALCOHOLIC PREPARATIONS

What precautionary steps does the Government take through the chemical laboratory to prevent illegal use of alcoholic preparations?

The Government exercises extreme care before approving preparations manufactured with *specially denatured alcohol.* Preparations which are susceptible of yielding potable alcohol by simple distillation or manipulation are disapproved.

Before the issuance of a permit authorizing manufacture, the Government requires the addition of bona fide essential oils or ingredients that can not be eliminated by simple distillation or manipulation.

QUOTA PLAN

How is industrial-alcohol production limited to actual commercial needs?

The Government seeks to avoid any surplus stock of alcohol by ascertaining the alcohol required and *limiting the production* of industrial alcohol *to the actual needs* of legitimate industry.

Each industrial-alcohol plant is allotted a fixed quota of the total alcohol to be produced. Only 40 per cent of the total quota for the year can be produced during the first six months of the calendar year. Arrangements are made to supply legitimate industries with an excess of that quantity if necessity warrants.

The quota plan prevents a surplus stock of alcohol on the market and thereby minimizes the danger of diversion.

ALCOHOL " REUSED "

What is meant by denatured alcohol being " reused "?

In some manufacturing processes alcohol is necessary as a solvent for the ingredients used, but does not exist as a part of the finished product.

The alcohol can be extracted from the liquid that remains, denatured again, and reused, but must be so reported each time it is used. The alcohol used in the extraction of drugs can be recovered and reused as many as fifteen times.

FORMULAS MODIFIED

What rôle is played by Government chemists in restricting industrial alcohol to lawful uses?

The Government does not issue a permit for the use of industrial alcohol for any manufacturing process

until the *process is examined* and the *product analyzed* by Government chemists. The product must be found unfit for beverage purposes before a permit is issued.

Chemists in the Washington (D. C.) laboratory make continuous studies for the modification of formulas for specially denatured alcohol. Such research is of great importance to legitimate industry and is one of the chief safeguards against illegal use of industrial alcohol.

DENATURATION POLICY

What is the practical result of extended research work by Government chemists?

An important result of chemical research work by Government chemists is the gradual *elimination of the weaker formulas* from certain lines of industry.

In this manner alcohol diversion has been substantially reduced. At the same time specially denatured-alcohol formulas have been made more adaptable for use in the arts and industries.

Legitimate American industry cooperates with the Government in maintaining a strong denaturation policy as a protection to lawful business.

DENATURANTS TESTED

Does the Government make the denaturants?

No. The Government *specifies* the denaturants. Denaturants are purchased by the proprietor of the denaturing plant from outside agencies and are tested by Government chemists before being used.

Government chemists also test samples of the alcohol after it is denatured to determine whether it could be diverted to beverage use.

DENATURING METHOD

How can the Government be sure that the denaturants are really added to the alcohol?

The denaturing of the alcohol is done in the presence of a Government officer, known as a storekeeper-gauger, who has the only keys to locks to the buildings, mixing tanks, and other necessary equipment used in denaturing alcohol.

The denaturing is usually done as the order comes in from the manufacturer for the kind of denatured alcohol formula and quantity desired.

PERMIT BONDS

Do manufacturing users of denatured alcohol pay a license fee?

No license fees are charged for the permits, but the permittees using alcohol are bonded, the penal sum of which depends on the quantity of alcohol withdrawn each 30-day period.

GOVERNMENT SAFEGUARDS

What precautions are taken by the Government to see that the manufactured products containing alcohol are not used for beverage purposes?

When the formulas and samples of finished products are submitted with the application for a permit, they are examined by the technical division of the Bureau of Industrial Alcohol to determine whether or not they are *bona fide products*, and can be easily manipulated for the purpose of obtaining potable alcohol.

Records showing the quantity of the product manufactured from the specially denatured alcohol received at the plant are closely scrutinized.

A Government officer can be stationed at the plant and observe the manufacture, if deemed advisable. Shipments of the commodity can be watched to make certain its destination, and the finished product can be purchased from retailers for *laboratory tests* for assurance of conformity to regulations.

STRONGER PROTECTION

Has the Government experienced any trouble with conversion of finished products into beverage liquor?

Yes. The Government has experienced trouble with diversion of *secondary products* after they had been placed on the market and were not under direct supervision of the Government's officers. Among these were ethyl acetate, thinners for lacquers, and disinfectants of an alcoholic content.

The conversion and manipulation of these finished products have unquestionably decreased, due to vigilance and cooperation of the Government and legitimate trades, and the adoption of modified formulas which offer stronger protection against illegal use.

INSPECTION METHOD

How does the Government know that the denatured alcohol is used in legitimate manufacture?

Before consideration is given to the issuance of a permit the Government conducts an investigation of the officers of the company, the product to be manufactured, the formula to be used, and the potential market for such a product.

Government officers inspect the plant frequently and have access to the company's records. Shipments of

alcoholic products may be watched. A check can be made of the disposition of the product to purchasers.

Every precaution is taken to see that all business transactions are legitimate from the time the denaturant is received until the manufactured product is marketed.

POSTWAR EXPANSION

How has denatured alcohol aided industry?

The denatured alcohol, being tax-free, has fostered the growth of science, arts, and industries, stimulated the production of new types of machinery, provided manufactured products at reduced retail prices, and created additional jobs for wage earners.

The use of industrial alcohol in the United States has increased from 1,000,000 wine gallons in 1906, when the Federal tax was removed, to approximately 100,000,000 wine gallons a year.

Manufacturers using alcohol as an essential chemical have risen to top rank in American industry.

NEW INDUSTRIES

How does the Government account for the steady increase in production of alcohol since the war?

Increased alcohol production in recent years is the result of the rapid growth in business in the chemical industries of the United States.

Since the war many new industries, using *alcohol as an essential chemical* in the manufacture of varied products, have been established.

Artificial leather, artificial silk, dyes, and lacquers are a few of the many new American industries that use alcohol in substantial quantities in their processes of manufacture and have developed steadily expanding markets.

PRODUCTS ANALYZED

Why are chemical laboratories maintained by the Bureau of Industrial Alcohol?

Laboratories are maintained by the Bureau of Industrial Alcohol to *prepare formulas* for denaturing alcohol so as to make it unfit to drink, and to *test formulas* to be used by every manufacturer applying for a permit to use industrial alcohol.

The *finished products are also tested* to insure compliance with the laws and regulations.

The laboratories also conduct the chemical work required by the Bureau of Prohibition in the Department of Justice, and the Bureau of Narcotics and the Bureau of Internal Revenue in the Treasury Department.

ISSUANCE OF PERMITS

Who issues permits?

The supervisor of permits of the field permit district in which the business of the applicant or permittee is located, or the commissioner of industrial alcohol in some cases.

AUTHORIZING TRANSACTIONS

What is a permit?

A permit is a formal written authorization by the Government for the transaction of business involving the manufacture, use, or sale of intoxicating liquors, and setting forth specifically the things that are authorized.

FUNDAMENTAL CONTROL

What is a "basic permit"?

A basic permit is an *original authorization* granted to a permittee for the transaction of business involving

the manufacture, use, or sale of intoxicating liquors, of the nature described, or modified for special conditions and circumstances.

PERMISSIVE VOLUME

How many permits are in force authorizing transactions involving use of alcohol and nonbeverage liquors?

On June 30, 1931, the number of permits in force, including all classes, totaled 177,883.

RENEWAL PROVISION

How long does a basic permit remain in force?

Basic permits are issued for one calendar year. Application must be made each year for renewal of the permit; otherwise the permit expires.

REVOCATION PROCEEDINGS

How is a permit revoked?

When the Government obtains sufficient evidence of violation of the terms of a permit, revocation proceedings are instituted for the cancellation of the permit.

Hearings are held before legal representatives of the Government, and if the Government can prove the violation charged, the permit is revoked or may be surrendered voluntarily.

PERMITTEES' RIGHTS

Is the decision of the Government final when a permit is revoked?

No; the permittee has the right to appeal the case to the Federal equity courts.

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BUREAU ORGANIZATION

When was the Bureau of Industrial Alcohol organized?

The Bureau of Industrial Alcohol was created by the act of May 27, 1930, known as the "reorganization act of 1930," and was organized on July 1, 1930.

REGIONAL DISTRICTS

How is the field service of the Bureau of Industrial Alcohol organized?

The field service comprises 12 regional permit districts. A supervisor of permits has charge of the work of each district. Each district comprises the States included in a United States judicial circuit.

ENFORCEMENT BOUNDARIES

Is the Bureau of Prohibition in the Department of Justice similarly organized?

Yes; the Bureau of Prohibition is divided into 12 administrative districts similar in geographical boundaries with regional permit districts maintained by the Bureau of Industrial Alcohol. A prohibition administrator has charge of each prohibition enforcement district.

JOINT PROCEDURE

What is meant by joint control exercised over permits by the Treasury and Justice Departments?

The prohibition reorganization act of 1930 provided that the Attorney General and the Secretary of the Treasury should prescribe all regulations relating to permits.

The act also gave the Attorney General the privilege of acting jointly with the Secretary of the Treasury on any application for permit.

Therefore no permit is granted, in cases in which the Attorney General desires to take joint action, without his approval.

STANDARDIZED METHODS

What has been the effect of standardization in permit procedure and inspection?

Lawful business has been facilitated and the Government's interests more fully safeguarded. Permit procedure has been improved to the end that all legitimate business shall be expedited.

A strengthening of the inspection system throughout the field service has aided materially in raising the standards of the public service.

ALCOHOL RECOVERY

Has any denaturant been discovered which is impossible of removal when added to ethyl (pure) alcohol?

The whole chemical world has been working on this problem for 50 years, and such a denaturant has not yet been found.

The skilled technician will always be able to recover alcohol from any mixture, if he has the necessary facilities and resources at his command.

The problem for the Bureau of Industrial Alcohol is to make *recovery* of the alcohol as *difficult* and *expensive* as possible, so that attempted manipulation will be unsuccessful.

DENATURANTS SPECIALIZED

What is an ideal denaturant?

The ideal denaturant *does not affect the utility* of the alcohol for manufacturing purposes but *does render the alcohol unfit for use as a beverage*, and can not be removed from the alcohol.

For example, in the artificial-silk industry one of the principal grades is nitrosilk. This is a colloidal solution of nitrocellulose in an alcohol-ether mixture.

In this case ether is the denaturant. The alcohol is made unfit for beverage purposes, but the denaturant meets every scientific and manufacturing requirement.

CHEMICAL REQUIREMENTS

Why is it impossible to use the same denaturant in all industrial alcohol?

Each industry needs special consideration with reference to the ingredients in the denaturants used.

For instance, in the manufacture of perfume the denaturant employed must not interfere with the delicate odor of the manufactured product. The denaturant must not be harmful to the skin.

It must have a chemical element that can not be counteracted by the addition of another chemical, and must be difficult of removal by distillation. It must also be compatible with the other ingredients used in the manufacture of perfume.

Each manufactured product presents its particular problem as to the type of denaturant to be used.

CHEMICAL TREATMENT

Can denatured alcohol be used for beverage purposes?

Denatured alcohol can not be used for beverage purposes.

For example, consider perfume manufactured with a high alcoholic content. The Government formula requires that "diethylpthalate" must be added to alcohol used in manufacturing perfume.

This denaturant renders the perfume so bitter and distasteful that the mixture is unfit for beverage purposes.

INDUSTRIAL MIXTURES

How many different formulas does the Government authorize for denatured alcohol?

There is 1 formula for *completely denatured* alcohol and 68 formulas for *specially denatured* alcohol.

DENATURANTS SUBSTITUTED

Are these formulas ever changed?

Yes. The Bureau of Industrial Alcohol constantly seeks to find more satisfactory denaturants that will be compatible with industry and afford better safeguards against diversion.

DIVERSIONS NEGLIGIBLE

Does the Government have a method of determining the possible diversion of denatured alcohol?

Government records show the quantity of denatured alcohol produced and the quantity received by manufacturers and other users. The quantity of products manufactured is ascertained from Government records.

Government chemists know the quantity of denatured alcohol necessary for such production. Laboratory tests made of finished alcoholic products on the market disclose any violation of bureau regulations. The diversion of denatured alcohol is a relatively small percentage.

DENATURANTS' CHARACTERISTICS

What are some of the requirements of an effective general denaturant?

1. It must render the alcohol obnoxious and nauseating, and wholly unfit for use as a beverage.
2. It must not be corrosive.
3. It must not be poisonous as the term is generally understood.
4. It must be available in quantity and at a reasonable cost.
5. It must not affect the utility of the alcohol for lawful uses.
6. It must remain with the alcohol under both distillation and chemical treatment and not be eliminated except with extreme difficulty and expense.

Recent developments in the utilization of complex mixtures, such as *alcotate* and *calol ethatate*, derived from crude petroleums of the west coast of the United States are worthy of note in this connection.

NONPOISONOUS SUBSTANCES

Does the Government poison alcohol to enforce prohibition?

No. The Government's first duty is to guard the Federal revenue by making denatured alcohol unfit for beverage purposes.

Congress, in enacting the tax-free denatured alcohol act to provide industry with alcohol, free of Federal tax, specified that all alcohol so used must be made wholly unfit for beverage purposes by the addition of suitable denaturing substances.

The Government constantly seeks to eliminate denaturants that are poisonous to the would-be drinker, whether he willfully or unknowingly consumes it for beverage purposes.

PRESERVATIVE USES

How extensive is the use of alcohol as a preservative?

Alcohol is one of the most efficient preservatives, especially for organic substances that would otherwise decompose or lose much of their original character.

SCIENTIFIC USES

For what purposes may pure alcohol be used free of Federal tax?

The law authorizes the withdrawal of tax-free pure alcohol by the following:

1. By the United States or any of its agencies.
2. By the several States and Territories or any of its municipal subdivisions or by the District of Columbia.
3. By any scientific university or college of learning.
4. By any laboratory for use exclusively in scientific research.
5. And for the use of any hospital or sanitarium.

With the exception of the United States Government, the several States and their municipal subdivisions, users of tax-free alcohol must obtain permits to purchase and give bonds to insure proper use.

They also are required to submit reports showing the use of pure alcohol withdrawn under permit.

BONDS REQUIRED

Is there any danger of tax-paid pure, or ethyl alcohol being used for beverage purposes?

The danger is minimized because commercial users of tax-paid alcohol are bonded when they desire to withdraw over a certain amount annually. Detailed reports are also required.

DENATURANTS' WARNING

Is it necessary that completely denatured alcohol should have a distinctive odor and taste?

The odor and taste of completely denatured alcohol used for antifreeze purposes constitute a *warning* that the liquid is *unfit for human consumption.*

COMPLETELY DENATURED

Why is it that completely denatured alcohol can be sold and used without a permit?

Completely denatured alcohol is used largely as an antifreeze solution for automobile radiators and is so effectively denatured as to preclude the possibility of its being used for beverage purposes. The product can therefore be sold and used without obtaining a permit.

The Government, however, requires all persons dealing in, storing, or using as much as 11 barrels within a period of 30 days to keep a record for inspection by Government agents. Manufacturers and their agents must also report deliveries of completely denatured alcohol in quantities of one barrel or more.

GOVERNMENT LIENS

Why does the Government hold liens on industrial-alcohol plants, distilleries, and bonded warehouses?

Liens on plants and warehouses, including the land on which located, and the spirits produced, are created by law for the purpose of *guaranteeing the payment of taxes* on products manufactured.

When the taxes on spirits produced are not paid, the property covered by liens, or the part required, becomes the property of the United States, thus satisfying the tax liability.

TAX GALLON

What is a tax gallon?

A gallon of 100 proof spirits. A gallon of liquor is taxed according to the quantity of alcohol it contains or according to its proof; therefore a tax gallon and a proof gallon are the same.

PROOF GALLON

What is a proof gallon?

Section 3249, Revised Statutes, provides that proof spirits shall be held to be that alcoholic liquor that contains one-half of its volume of alcohol of a specific gravity of seven thousand nine hundred and thirty-nine ten thousandths (0.7939) at 60° F.

The highest degree of proof obtainable is 200°, which is absolute alcohol; that is, without water. Alcohol as generally produced ranges from 188° to 192° of proof.

A wine gallon of 190 proof would therefore contain 1.9 as much alcohol as a proof gallon.

BONDED WAREHOUSES

What are bonded warehouses?

Bonded warehouses are the storage houses for liquors on which the Federal tax has not been paid. The liquor is under the joint custody of the proprietor, who is bonded for the safe-keeping of the liquor, and the Government officer who holds the keys to the building. No one can enter the premises except in his presence and with his permission.

Alcohol bonded warehouses are operated in connection with the manufacture of alcohol for nonbeverage purposes.

SURPLUS PREVENTED

Why is the quantity of industrial alcohol a permittee may require regulated by the Bureau of Industrial Alcohol?

It is the function of the Federal Government to keep industrial alcohol in *legitimate channels*. Any surplus of industrial alcohol in excess of the quantity necessary for legitimate manufacture affords possibilities of diversion.

DISTILLERIES

What is a distillery?

A distillery is a building equipped for the manufacture of distilled spirits. The type of distillery is known by the product manufactured; viz, alcohol distillery, whisky distillery, fruit distillery, or brandy distillery.

PRODUCING PLANTS

How many alcohol distilleries and other plants are in operation?

There were 46 industrial-alcohol plants operated in the production of industrial alcohol during the last fiscal year.

There were 72 bonded warehouses and 60 denaturing plants in operation.

CENTRAL LABORATORY

What chemical tests are necessary before a permit is issued for the use of alcohol in manufacturing?

The formulas for all preparations and processes using either pure or denatured alcohol are required to be submitted to the technical division of the bureau at Washington, D. C., for review and analysis before approval can be given for the issuance of a permit.

Chemists of the bureau in the central laboratory conduct most thorough tests to determine the lawful character of the product involved.

Chemists engaged in this work are familiar with all preparations and processes in which pure or denatured alcohol is used for manufacturing.

OBJECTIVE INDUSTRIAL

What has denatured alcohol to do with prohibition?

The denatured alcohol act was passed on June 7, 1906. The eighteenth amendment was ratified by the necessary 36 States on January 16, 1919, nearly 13 years later. Prohibition was not a consideration in the passage of the denatured alcohol act.

STOREKEEPER-GAUGERS

How does the Government keep close check upon plants producing alcohol under permit?

A storekeeper-gauger who is an employee of the Bureau of Industrial Alcohol is stationed at distilleries, alcohol plants, and warehouses in which alcohol or other liquors are stored.

He holds the keys to Government locks on the distillery, warehouse, and other buildings. The locks can not be opened except in his presence.

The storekeeper-gauger is familiar with distilling processes and the apparatus used. No phase of production, storage, withdrawal, or distribution may be carried on except under his supervision. He keeps records and makes regular reports of operations.

LIQUOR TAXATION

What is the first record of tax on distilled spirits in the United States?

The United States Congress at its first session under the Constitution passed a law, approved July 4, 1789, placing a tax on the importation of ale, beer, porter, cider, malt, molasses, spirits, and wines.

By the act of March 3, 1791, import duties on liquors were raised, and an excise tax was placed on all spirits distilled within the United States, but not on malt liquors.

This tax continued until June 30, 1802. It was revived in 1813 and 1814 for about three years.

The necessity for additional revenue for the conduct of the Civil War again made necessary the taxation of alcoholic liquor.

Although the rates have changed, the tax on liquor has been continuous since July 1, 1862.

TAX PENALTIES

Is a Federal tax penalty on outlawed liquors legal?

Yes. The tax penalty may be assessed and collected from persons violating the national prohibition act. Double the amount of tax provided under internal-revenue laws is assessed with an additional penalty of $500 on retail dealers and $1,000 on manufacturers.

INDUSTRY PROMOTED

Does rigid Government permit control promote the interests of legitimate industry?

Legitimate requirements of business concerns using alcohol as a chemical raw material in manufacturing or for other lawful purposes are fully safeguarded by the rigid measures invoked to keep industrial alcohol in lawful channels.

Rigid control measures at the same time have effectively checked alcohol diversions and other unauthorized uses of alcohol. Legitimate industry has a primary concern in keeping its own ranks free of the unlawful element.

The Government endeavors to *facilitate the requirements of lawful users.* Lawful users therefore are prompted by sound business reasons in supporting a strong Government policy aimed to restrict industrial alcohol solely to commercial purposes.

ADMINISTRATIVE CAUTION

What general administrative method has brought about a lessening of alcohol diversion?

It is the constant endeavor of administrative officials to strengthen the safeguards in all phases of permissive procedure.

Officials exercise the utmost caution at all times in issuing permits for lawful use of alcohol.

Improved procedure throughout the field organization as well as more effective prosecution of those who may be found guilty in conspiracies to divert alcohol to illicit channels will have a tendency to make less difficult the problem relating to diverted liquors.

ALCOHOL FUEL

Is it possible to use alcohol as fuel in automobile engines?

Yes; it has been found practicable in some foreign countries, where economic factors have given it preference over gasoline. In the United States, however, alcohol is not used in internal-combustion engines at the present time.

It is shown that the presence of 5 per cent of water in high-proof alcohol has been a serious handicap to its use as a component part of the blended fuel.

The dehydration of alcohol by continuous distillation and at a reasonable cost has removed one serious defect in alcohol-blended fuel.

Should petroleum distillates rise substantially higher in price, or should the supply become scarce, it is entirely possible that an alcohol-blended fuel would be available for practical use in automobile engines.

FOODS AND MEDICINALS

How much pure alcohol is used in the United States every year in the manufacture of food and medicinal preparations?

Nearly 10,000,000 gallons of ethyl (pure) alcohol is used annually by the manufacture of drugs, food preparations, flavoring extracts, and other commodities designed for internal human consumption.

COORDINATED INSPECTION

Before the Government issues a permit for the use of alcohol what steps are taken to determine the merits of the application?

The Bureau of Industrial Alcohol, through its inspection service and coordinated investigative branches, conducts thorough inquiry concerning the applicant's business standing and the business plans contemplated.

Every factor that has a bearing on the legitimate use of alcohol sought to be used for manufacturing or other purposes is carefully weighed before an application for a permit is approved.

CONTROL PROBLEM

Did the enactment of the prohibition law render more difficult the Government's problem of control of alcohol for commercial purposes?

Yes; prohibition made industrial-alcohol control more difficult, especially in the earlier years of prohibition, when bootleggers, with the supply of bonded whisky cut off, turned to denatured alcohol as their chief source of supply.

The Government was compelled to tighten the lines of administrative control. It was necessary to build up an organization adequate to prevent abuses of per-

mit privileges. As the years passed the problem became less difficult.

Rigid control measures made it increasingly difficult and hazardous for bootleggers to seek industrial alcohol for beverage purposes, and they turned to crude methods of manufacturing alcohol from corn sugar, and other raw materials, finding it a less costly expedient.

ELIMINATING VIOLATORS

To what extent are permittees responsible for industrial-alcohol diversion?

Relatively few permittees now are suspected of diverting alcohol. In earlier years this phase of permit control was a serious one. Many unscrupulous individuals obtained permits during the earlier years of prohibition and used them for unlawful purposes.

Improved procedure governing the issuance of permits and systematic methods for inspection of all business transactions aided materially in eliminating the unscrupulous element from the permit lists.

The Government's system of control to-day is so adjusted that it is extremely difficult for a dishonest individual, firm, or corporation to obtain a permit for the use of industrial alcohol.

A permittee who does violate the provisions of the permit is caught eventually, his permit is revoked and he is barred from the use of alcohol in business.

ILLICIT ALCOHOL

From what principal source is illicit alcohol now obtained?

The alcohol which bootleggers peddle is derived principally from illicit fermentation of corn sugar, cane sugar, molasses, and grain to a lesser degree.

TYPICAL USES

What are some typical large quantities of specially denatured alcohol used in American products?

Artificial-silk manufacturing requires 4,000,000 gallons each year.

Lacquers, lacquer thinners, and solvents require approximately 9,000,000 gallons.

Imitation-leather manufacturers use 1,400,000 gallons.

Shellac, varnish, and paint manufacturers use 5,000,000 gallons.

Vinegar manufacturers use 9,000,000 gallons.

Toilet waters, perfumes, and cosmetics require 5,000,000 gallons.

Pyroxylin and pyroxylin plastics require approximately 6,000,000 gallons.

Rubbing-alcohol manufacturers use 1,000,000 gallons.

Chemicals require 6,000,000 gallons.

Hair-tonic manufacturers use 2,000,000 gallons.

Ether requires 1,235,000 gallons.

Liniments and lotions account for 1,142,000 gallons.

Antiseptic solutions consume 1,000,000 gallons.

Drug manufacturers use 5,000,000 gallons.

Dye manufacturers consume 600,000 gallons.

Nitrocellulose requires 13,000,000 gallons.

Solvents account for 1,000,000 gallons.

SOLVENT USES

In the use of alcohol as a solvent what typical examples can be cited?

There are hundreds of uses of alcohol as a solvent. These few may be cited for purposes of illustration:

Alcohol is the solvent used in the preparation of flavoring extracts for household and manufacturing purposes.

Alcohol is a necessary solvent in the manufacture of hundreds of drugs and medicinal preparations. It is a solvent as well as a component part in manufacturing many synthetic chemical compounds used medicinally.

It is a necessary solvent in the manufacture of dyes. It is used in the purification and manufacture of many of the so-called coal-tar medicinal compounds. It is a solvent in all kinds of varnishes, shellacs, paints, lacquers, and miscellaneous protective coverings.

BUSINESS RECORDS

Is a permittee's records an accurate index to his business character?

Every permittee must keep his records up to date and always open for inspection by Government officers. Discrepancies in the proper use of alcohol withdrawn under a permit may be revealed by a bureau inspector's check on these records.

Examination of a permittee's records, however, is only one of many phases of inspection procedure. Records may be falsified. But the Government has other checks on the permittee to disclose any irregularities, especially if he is suspected of violating the law.

The Government has a record of the quantity of alcohol shipped to the permittee by the alcohol manufacturer. The Government can ascertain from invoices on file in the manufacturer's office the use made of the alcohol in the form of manufactured alcoholic products. It can trace those products to the original purchaser.

While there is no authority to go beyond the original purchaser, the Government often can determine from the business standing of an original purchaser and the *character of his sales transactions* whether or not the manufacturer of an alcoholic product or other user of industrial alcohol under a permit is willfully violating the terms of the permit.

CRIMINAL PROCEEDINGS

Do inspectors of the Bureau of Industrial Alcohol institute criminal proceedings for violation of the national prohibition act?

With the exception of arrests made when an offense is being committed in an inspector's presence, or seizures of property involved in a violation of the law, inspectors do not initiate criminal procedure, except upon the advice of the Federal district attorney.

When requested by the district attorney, inspectors may swear out warrants and commence proceedings. Then, if the district attorney approves, the case is referred to the prohibition administrator for further action.

TECHNICAL QUALIFICATIONS

How rigid are the requirements for the position of Government storekeeper-gauger?

Standards are higher than in earlier years because expansion of the alcohol industry, larger plants, and improved processes require a greater degree of expertness and technical training.

An applicant for the position of storekeeper-gauger now must have had at least one year's experience in a chemical or physical laboratory or in a chemical plant, or as a gauger, storekeeper-gauger, Government in-

spector of chemical plants, distilleries, breweries, wineries, or pharmacies.

The applicant is subjected to a most thorough character investigation.

ARRESTING VIOLATORS

Can inspectors of the Bureau of Industrial Alcohol in the Treasury Department make arrests for violation of prohibition laws?

Yes. Such officers are not primarily charged with the duty of enforcement of prohibition laws. But in their work of inspecting places of business of permittees, if a person is detected in the actual commission of a crime, the inspector can arrest the violator.

He may take the violator before a United States commissioner, make a report to a United States attorney through the prohibition administrator, and await orders as to further procedure in the case. All facts in possession of the inspector are furnished to the district attorney.

TECHNICAL INSPECTIONS

How does the commissioner of industrial alcohol assure himself that his orders are being obeyed by storekeeper-gaugers and other officers on duty at alcohol and other plants?

The commissioner is kept advised on this matter by special inspectors. Under the direction of the commissioner at Washington a mobile force of specially qualified inspectors make technical inspections of such plants. They also check the work of inspectors and other officers working under the direction of supervisors of permits.

INSPECTION CLASSIFICATION

Are permittees divided into classes with reference to periodic inspections?

For the purpose of making assignments of inspectors to make periodic inspections permittees are divided into two classes, based on past permit history:

Class A—Permittees whose record and transactions merit the confidence of the Government.

Class B—Permittees whose record and transactions indicate the necessity for special investigation. A class B permittee receives a more thorough and frequent inspection than a permittee of class A.

SCOPE OF ADMINISTRATION

What is the difference between the work of the Bureau of Industrial Alcohol in the Treasury Department and the Prohibition Bureau, Department of Justice?

The Bureau of Industrial Alcohol administers the permissive provisions of the national prohibition act relating to pure or denatured alcohol, distilled spirits, wine, and cereal beverages.

The Bureau of Prohibition has charge of the detection of violations of the national prohibition act and the prosecution of violators in the Federal courts.

REVOCATION GROUNDS

What are some of the grounds on which a permit may be revoked?

(1) Fraud, deceit, concealment or misrepresentation used to obtain permit; (2) failure in good faith to conform to the law; (3) failure to observe the regula-

tions; (4) failure to observe the terms of the permit: (5) attempt to transfer permit privileges to another person; (6) failure to keep required records or allow inspection; (7) failure to comply with internal-revenue and other laws relating to operations; (8) violation of a State law relating to intoxicating liquors.

SUSPECTED PRODUCTS

What control has the Government over the manufacture and sale of alcoholic preparations which after being marketed are used for beverage purposes in violation of the law?

Whenever it appears to the commissioner of industrial alcohol that the sale of an alcoholic preparation, such as flavoring extract, lotion, hair tonic, and patent medicine, is being substantially increased because of suspected use for beverage purposes, the commissioner may require the manufacturer to change his formula or he may revoke the permit of the manufacturer.

JOINT INVESTIGATION

When is a joint investigation of an applicant for a permit made by the Treasury Department and Department of Justice?

Joint investigations are made only at the joint direction of the supervisor of permits and the prohibition administrator. The prohibition administrator has the right to ask for a joint investigation of any applicant for a permit.

KEY INDUSTRY

Why did the Government list industrial alcohol as a key industry in national defense?

The alcohol industry is vital in national defense because in its peace-time activities it sustains the other chemical industries and is so constructed that it can be expanded rapidly to meet war-time needs. Industrial alcohol therefore has a fundamental relation to the country's welfare.

During the war alcohol, ether, and acetone were used in making smokeless powder. Alcohol was required in large quantities to manufacture poisonous gases. Alcohol was used in making munitions of various kinds.

It was also an essential in the manufacture of hospital supplies and other necessities.

TECHNICAL DEFINITIONS

What is the difference between a wine gallon and a proof gallon of alcohol?

A wine gallon is a measure of quantity (231 cubic inches) of any proof.

A proof gallon is a gallon of 100-proof spirits.

A wine gallon of 190-proof spirits is equal to 1.9 proof, or tax, gallons.

PRESCRIBING REGULATIONS

Who prescribes the regulations governing permits issued by the Bureau of Industrial Alcohol in the Treasury Department?

Regulations are prescribed and promulgated jointly by the Secretary of the Treasury and the Attorney General.

REORGANIZATION ACT

Why was the Bureau of Prohibition transferred to the Justice Department?

Congress passed the "reorganization act of 1930," transferring prohibition enforcement from the Treasury Department to the Department of Justice, in order to centralize in that department all activities relating to the detection and prosecution of violators of Federal prohibition laws.

The act created the Bureau of Industrial Alcohol in the Treasury Department to administer the permissive provisions of the national prohibition act relating to pure or denatured alcohol, distilled spirits, wine, and cereal beverages.

MAKING SEIZURES

Do inspectors in the Bureau of Industrial Alcohol make seizures of premises and materials used in manufacturing liquors?

They have full legal authority to make seizures if permittees, or others, are detected in the actual commission of a crime.

OPEN INSPECTIONS

When an inspector has reason to believe that industrial alcohol is being diverted to unlawful uses, does he make an investigation or report the matter to the Department of Justice?

Bureau inspectors follow up the case if it arises from an open inspection. If it is a seizure, the Department of Justice is requested to take proper action.

MOLASSES USED

How much molasses is required to produce a gallon of alcohol?

From 2½ to 2⅞ gallons of molasses are required to produce 1 wine gallon of alcohol of 190° proof spirits, under the most improved processes now followed by producers.

GRAIN USED

How much grain is necessary to produce a gallon of alcohol?

One bushel of grain will produce 2½ wine gallons of alcohol of 190° proof spirits, if proper equipment is used in manufacture.

SEAPORT PLANTS

Why are industrial-alcohol-producing plants located near seaports?

Since 90 per cent of the industrial alcohol in the United States is made from blackstrap molasses, the bulk of which comes from Cuba, production cost is kept at a minimum by establishing industrial-alcohol plants near seaports.

At Boston, New York, Philadelphia, Baltimore, New Orleans, and other seaports where the largest alcohol-producing plants are located the molasses is pumped directly from the ship into the storage tanks of the distillery.

SYNTHETIC ETHYL ALCOHOL

How would the alcohol industry be affected if blackstrap molasses, now used as a raw material in alcohol manufacture, should be unobtainable at a reasonable price?

Alcohol could be produced synthetically. Alcohol is now being produced synthetically on an extensive

scale. Millions of gallons a year are being manufactured from ethylene gas.

The ethyl alcohol produced from ethylene gas is sufficiently pure to be used in practically 90 per cent of the preparations and processes now using ethyl alcohol produced by the fermentation of blackstrap molasses or grain.

Chemists are of the opinion that synthetic ethyl alcohol could be sufficiently purified to be used in any preparations or processes now using alcohol produced by fermentation.

The cost figures on production of synthetic ethyl alcohol have not been disclosed, but the mechanical difficulties of production apparently have been solved.

Expert opinion holds that if the cost of production is no greater than in the fermentation processes now being used, the quantity that can be produced synthetically is only limited by the quantity of coal and petroleum oils available.

PRODUCTION SINCE 1907

What increase has been shown in the use of industrial alcohol since the Federal tax was removed in 1906?

The table below shows the alcohol produced annually since the passage of the tax-free denatured alcohol act on June 7, 1906. It will be noted that production was unusually large during the war-time period. In 1923 there began a phenomenal expansion of American chemical industries with continued growth in succeeding years.

Alcohol produced during the fiscal years 1907 to 1931, inclusive

	Proof gallons		Proof gallons
1907	77, 051, 166. 8	1920	98, 436, 170. 3
1908	67, 835. 037. 6	1921	85, 068, 776. 3
1909	58, 862, 463. 3	1922	79, 906, 101. 5
1910	68, 534, 247. 2	1923	122, 402, 849. 8
1911	68, 778, 809. 7	1924	135, 897, 725. 8
1912	73, 630, 032. 8	1925	166, 165, 517. 8
1913	78, 972, 108. 1	1926	202, 271, 670. 3
1914	78, 874. 219. 9	1927	184, 323, 016. 9
1915	81, 101, 063. 7	1928	169, 149, 904. 8
1916	182, 778, 245. 8	1929	200, 832, 051. 1
1917	211, 582, 944. 3	1930	191, 859, 343. 4
1918	150, 387, 680. 6	1931	166, 014, 346. 0
1919	98, 160, 323. 8		

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